

Yukio JOTANI* & Hideaki OHBA**: *Hibiscus pacificus*
 Nakai from the Volcano Group of Islands, Japan***

常谷幸雄*・大場秀章**: 硫黄列島に特産するイオウトウフヨウ

To revise the aggregation of *Hibiscus mutabilis* L. it is much wanted to reveal the identity of a *Hibiscus* native to two tiny islands, Kita Iwojima (San Alessandro Isl.) and Minami Iwojima (San Augustino Isl.) in the Volcano Group of Islands, ca 1300 km south of Tokyo (142°E 24-25°N). This *Hibiscus* has been considered to be conspecific with *H. mutabilis* (Tuyama 1970, 1981, Ono & Kobayashi 1983), though Nakai adopted the name of *H. pacificus* on the specimens collected by Nakai himself in 1919 and by T. Tuyama in 1933 and 1935, deposited in the Herbarium, University of Tokyo (TI). But he never published the name.

In 1981 the senior author obtained a living branch of this *Hibiscus* collected from Kita Iwojima by T. Nakamura (Tokyo Univ. of Agriculture) and propagated it by cutting. One of the cuttings cultivated in a greenhouse, which became 4 m high and about 15 cm round at the base, opened flowers in December 1984. The junior author observed a living site of the *Hibiscus* in Minami Iwojima in 1982.

The Volcano *Hibiscus* differs from all the known species in the aggregation of *H. mutabilis*, though it particularly comes near

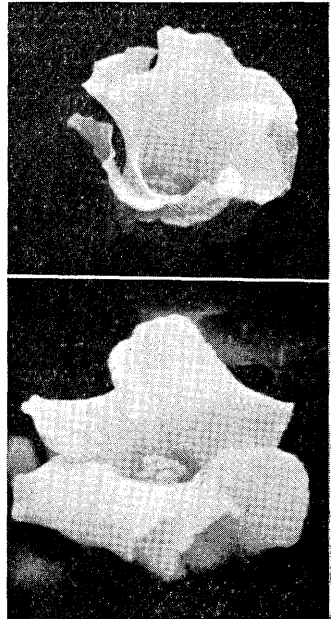


Fig. 1. Flowers of *Hibiscus pacificus*
 (×ca 1/2).

* Department of Biology, Tokyo University of Agriculture, Setagaya, Tokyo 156. 東京農業大学 生物学教室.

** Department of Botany, University Museum, University of Tokyo, Hongo 7-3-1, Tokyo 113. 東京大学 総合研究資料館植物部門.

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to *H. Makinoi* from S Japan (S Kyushu and Ryukyu; Jotani & Ohba 1984). Therefore, we desire to describe this *Hibiscus*, *H. pacificus*, here. This has tubular-funnel shaped flowers with petals which are basally depressed by the calyx (Fig. 1). The corollas of *H. Makinoi*, *H. mutabilis*, *H. taiwanensis* Hu and *H. indicus* (Burm. f.) Hochr. are rotate and their petals are spreading from the base or nearly so. The hairs of the outer surface of the petal of *H. pacificus* are simple and transparent and neither reddish as shown in *H. Makinoi*, *H. mutabilis*, *H. indica*, and *H. taiwanensis* nor stellate as found in *H. indicus*. The Volcano *Hibiscus* is unique to have a knotted transparent multicellular glands at the inner surface of the petal base. Other differences between *H. pacificus* and *H. Makinoi* are summarized in Tab. 1.

Though the present figure of each island of the Volcano Group is considered to appear within the period from no more than 10 to 30 thousand years ago (Ono & Kobayashi 1983), 9 species are regarded as endemic to the islands.

Tab. 1. Differences between *Hibiscus pacificus* and *H. Makinoi*.

	<i>H. pacificus</i>	<i>H. Makinoi</i>
Length of the upper part of pedicel	7-8 mm	10-20 mm
Hairs on pedicel	fastigate	stellate
Segments of epicalyx	linear to lanceolate	subulate to narrowly lanceolate
Calyx	1.2-1.5 times longer than the epicalyx	1.5-2 times longer than the epicalyx
Calyx-tube	nearly as long as the lobes	obviously shorter than the lobes
Calyx-lobes	erect to suberect	ascending
Petals	narrowly flabellate 3-4 cm wide	spathulate to ovate to broadly ovate 2.5-3 cm wide
Stigma	saddle shape	capitate
Lobes of leaf	very broadly triangular	triangular
Stipules	ovate to broadly ovate	lanceolate

The Volcano flora shows a strong connection with those of the eastern Asiatic regions, particularly Taiwan and the Ryukyu Islands, and contains a number of common or corresponding species. For example, the 58 species (49.2%) among the total 118 species of the Minami Iwojima flora are common to the Ryukyu Islands (Ohba 1982). In the case of *Hibiscus*, the closest of *H. pacificus* is apparently *H. Makinoi*. The pattern of the united range of distribution of these two species and *H. taiwanensis* resembles that of *Crossostephium chinense* (L.) Makino, which is a representative to show an extension of the eastern Asiatic elements to the Volcano Islands (Fig. 2).

Hibiscus pacificus Nakai ex Jotani et H. Ohba, sp. nov. (Fig. 3)

Hibisci Makinoi Jotani et H. Ohba affinis, a quo imprimis corollis tubulosis (non explanatis ex basi) infundibuliformis (non rotatis) cum petalis anguste flabellatis (non spathulatis nec obovatis) 4.5-5.5 (nec 3.5-5) cm longis 3-4 (nec 2.5-3) cm latis extus pilis hyalinis simplicibus vestitis differt.

A *H. mutabili* L. lobis foliorum latissime (non anguste) triangularibus obtusis

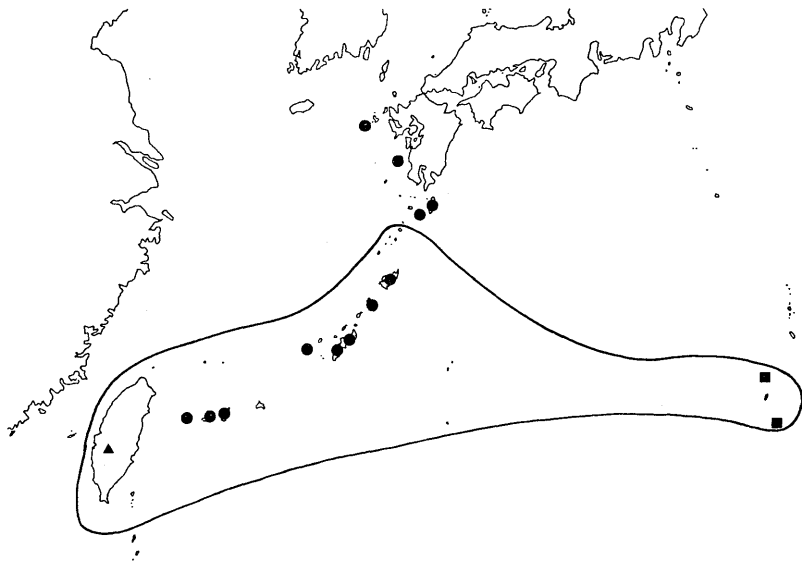
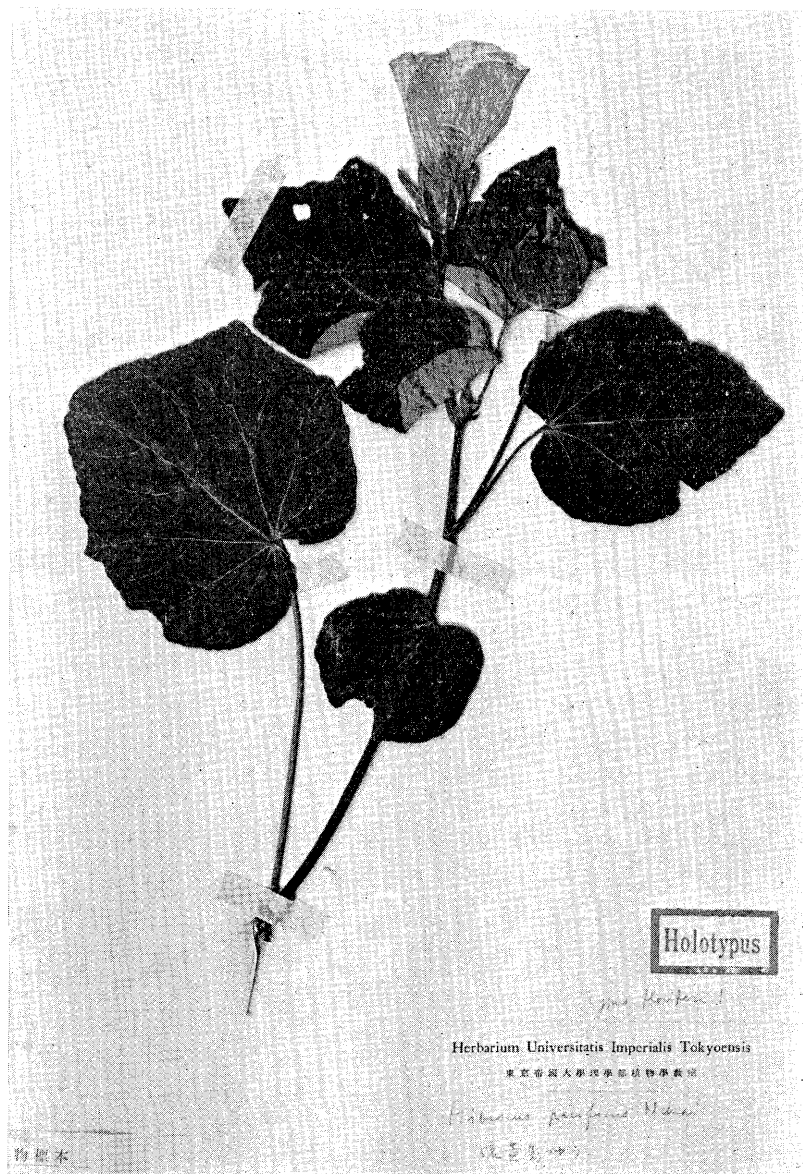


Fig. 2. Distribution of *Hibiscus pacificus* (■), *H. Makinoi* (●) and *H. taiwanensis* (▲).
Line indicates the range of *Crossostephium chinense* (Compositae).

Fig. 3. The type of *Hibiscus pacificus*.

(nec acuminatis) et sine pilis glanduliferis multicellularibusque vene differt.

Frutex erectus usque 4 m altus. Ramuli teretes, ad circa 1 cm diametro, cineraceis, pilis scabris brevibrachiato-stellatis dispersis.

Folia alterna, persistentia, petiolata; lamina chartacea, pentagonia vel late ovata, in circuitu vere 6–11 cm longa 7–12 cm lata, basi cordata, parte superiore vulgo improfundissime 3-lobata vel fere integriuscula, lobis latissime triangularibus apice semper obtusis, lobo medio conspicuo longissimo, margine brevissime irregulariterque remote dentiusculata, 7–9-nervata, nervi radiati 3 basales medii ad apices loborum rectiusculi, utrinque passim elevati et 2–3 nervis lateralibus, in apices dentium marginalium attingentes, venulis reticulato-anastomosantibus; folia imprimis utrinque pilis hyalinis brevibrachiato-fastigiatis manifeste persistentibus (sed denique pluries adpersis et scabris) dense oblecta. Petiolus vulgo lamina longior, toto pilis fastigiatis oblecta. Stipulae modice vel late ovatae erectae, ad 8 mm longae et 4 mm latae, pilis fastigiatis dense dispersis scabrae, vere cadentes.

Flores diurni, inter Novembrem et (?) Januarum, in summis axillis solitarii sed raro ad racemosos laxos terminales paucifloros digesti. Pedicellus teretes, petiolo annexo circiter aequilongus, infra apicem articulatus, supra articulum per anthesin 7–8 mm longus circa 3 mm diametro (post anthesin leviter elongatus), in hypanthium obconicum paulo incrassatus, undique scaber pilis fastigiatis dense vestitus. Epicalycis segmenta 7–9, in marginem hypanthii posita, a calyce separata, libera, suberecta, leviter crassiuscula, vulgo 10–15 mm longa 2–4 mm lata, paene lineata vel lanceolata, apice acuta vel acuminata, utrinque pilis fastigiatis hyalinis vestita.

Calyx chartaceus, ovoideus, epicalyce 1.2–1.5-plo longior, 5-fidus, tubo lobis aequilongo vel paulo brevior, post anthesin paulo accrescens; segmentis ovatis vel latissime lanceolatis, acutis vel breviter acuminatis, per anthesin erectis vel suberectis 10–12 mm longis basi 7–9 mm latis, extus indumento denso pilorum fastigiorum longibrachiatorum hyalinorum oblectus, intus et circum marginem densis pilis fastigiatis longibrachiatis albis et cetera eis sparsis simplicibus multicellularibus luridissimis vestitus. Petala circa 4.5–5.5 cm longa 3–4 cm lata, pauxillum inaequilatere anguste flabellulatis, apice rotundata, per anthesin margine sine imbricantes, infundibuliformia sed parte amplificata patentiuscula; extus plus minusve bicolorata (rosacea in parte albescentia) pilis hyalinis simplicibusque sparse vestita; intus rosacea vel raro albescentia, basi lutescentia et glandulis

multicellularibus obsita. Columna staminalis petalis valde brevior, circa 2.5 cm longa basi 6 mm lata, subviridis, pilis glandulis multicellularibus ubique sparse vestita, basi pulvinulis petalorum cingens, a circa basi ad apicem stamina circiter 4 mm longa gerens; antheris ante dehiscentum pallide fumosis; pollinis granulis 110–130 μ diametro, pantoporatis, globosis spinulosis. Ovarium campaniforme, 5-lobulare, 6–8 mm longum, pilis hyalinis et simplicibus et glandulis multicellularibus longioribusque vestitum; stylus toto circa 1.5 cm longus, paene glaber, parte superiore 5-fidus, segmentis circa 6 mm longis; stigma selliforme viridiusculum, papillosum.

Capsula 5-locularis, obovoidea, apice rotundata, 2.2–3 cm longa, extus pilis et simplicibus ultra 2 mm longis et stellatis brevissimis oblecta, intus secus suturas pilis longissimis circa 3 mm longis dense vestita. Semina numerosa, reniformia, 3 mm longa, brunnea, pilis simplicibus ultra 1.7 mm longis dense vestita.

Holotypus. JAPONIA. Insula Kita Iwojima insularum “Volcano” (Tokyo Praef.), Kitanohana (Tuyama on Nov. 20, 1935 (fl.), T₁).

Specimens examined. Kita Iwojima, sine loco specialit. (Nakai on June 21, 1919 (fr.), T₁; Fujikawa on Aug. 21, 1930, T₁; Tuyama on Jul. 25, 1933 (fr.), T₁; Jotani 39250–39254, 39257 ex planta culta in Hortus Botanicus Izu-oshimensis, T₁); sine loco specialit. In bush along the valley, alt. 100 m (Yamazaki & Enomoto on May 27, 1970, T₁); sine loco specialit. In sunny bush, alt. 500 m (Yamazaki & Enomoto 166, T₁); Sandoru (Yamamoto on Aug. 20, 1930, T₁). Minami Iwojima, sine loco specialit. (Okabe on Oct. 22, 1935, T₁, Yasui on June 12, 1981, T₁); northern part, alt. ca 5–100 m (Nakaike 25, T₁); S slope, alt. ca 400 m (Ohba 826138 (fr.), T₁); around the summit, alt. ca 910 m (Ohba 826065, T₁).

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本文は、イオウトウフヨウに関して行なったこれまでの研究結果をまとめ、記載を行なったものである。筆者のうち常谷は、北硫黄島から1981年に東京農業大学中村武久助教授が得たイオウトウフヨウの枝を入手し、さし木した。大場は1982年に南硫黄島でイオウトウフヨウを観察した。伊豆大島ハワイ植物園にて、さし木より得た4本の苗のうち、1本は温室、他は圃場に定植した。温室内に定植したものは生育が特によく、基部から2分し、ほぼ真っすぐに伸長し、1984年末には高さ4m、基部の幹囲は約15cmになった。1983年には着蕾したもの、虫害をうけ未開に終わったが、翌年12月5日に第1花が開き、それ以後開花が続いた。

イオウトウフヨウの特徴、近縁種との比較は欧文欄に記したが、ここに花の形態について若干補足したい。イオウトウフヨウの花は上向きに開花し、芳香がある。花冠が十分に展開しないのは、花冠の基部が萼筒によりしめつけられているためである。因みに萼筒を除いてやると花冠は展開する。副萼片は、萼筒に密着して上方に向かって伸長する。背側は淡緑色を帯びるが基部では稍々色が淡く、両縁が僅かに紫褐色を帯びることがあり、中肋部を中心として僅かに縦に盛上がる。萼は内面淡緑色で脈間部は僅かに淡紫褐色を帯び、基部には幅1mm内外の蜜腺群がある。花卉は一方向に旋回する。旋回は、同一個体に左巻きと右巻きのものが混ざる。花卉の外側先端部は、淡紅色から殆ど白色で花により差があり、基部は淡緑色である。また、表面には透明の毛が生えるが、基部には2叉状の毛を、さらに縁には単細胞の綿様毛が生える。内側は通常淡紅色であるが、白色に近いものもある。また、基部付近は淡黄色を帯び、その表面には多細胞からなる透明のチョロギ形をした腺が散生する。花糸はずい柱の基部から先端部付近（ずい柱の分枝上にも生じる）にまで生じるが、多少段階状に群となる傾向が認められる。子房には多細胞からなる無色で鞭状の腺毛および単細胞からなる無色の毛が密生する。ずい柱は淡緑色で上半部は5分枝する。柱状部はおおよそ長さ8mm、径1mm、分枝の長さ約7mmである。柱頭は背軸側に向かって広がるサドル形で、淡緑色を呈する。

本種はフヨウ節に属し、サキシマフヨウに近縁である。本種には「イオウトウイチビ」（東京営林局、小笠原国有林植物概観、1929）と「イオウトウフヨウ」（東京府、小笠原島の植物、1939）の和名が用意されている。しかし、フヨウ節に所属することを考慮にいとると、和名にはイオウトウフヨウがふさわしいように思われる。本種はかつて北硫黄島で樹皮より繊維をとり縄として利用されたという（東京営林局、上記、1929）。